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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,933	06/06/2006	Masahiro Watanabe	12336/10:1	1816
3528	7590	07/18/2008		
STOEL RIVES LLP 900 SW FIFTH AVENUE SUITE 2600 PORTLAND, OR 97204-1268			EXAMINER LSTVOYB, GREGORY	
			ART UNIT	PAPER NUMBER
			1796	
			MAIL DATE	DELIVERY MODE
			07/18/2008	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/581,933

**Applicant(s)**

WATANABE ET AL.

**Examiner**

GREGORY LISTVOYB

**Art Unit**

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 April 2008.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 and 22-32 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-7 and 22-32 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-8508)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 22, 26, 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Parish (US 5302652) in combination with Kuromatsu et al (JP2002-105200, cited in the Office Action filed on 08.08.2007) herein Kuromatsu or Yin et al (Novel sulfoalkylated polyimide membrane for polymer electrolyte fuel cell, Chemistry Letters, Vol 32, N4(2002), pp 328-329) herein Yin.

Parish discloses a conductive polyimide based on ODP(4,4 oxydiphthalic anhydride) and 50% mol APB (1,3 bis (4-aminophenoxy) benzene) and 50%mol HMD (hexamethylene diamine), see Table IV, entry 9). The conductivity achieves with adding carbon particles (see Column 6, line 15). The above material is capable to form a film and have high Tg values. In addition, polyimides, produced with the same synthesis method have intrinsic viscosity values between 1.02 and 1.45 dl/g. Therefore, both Mw and Mn values are higher than 5000.

Parish does not disclose any charged groups in his polyimide (i.e. sulfonic, alkoxy sulfonic, etc).

Kuromatsu or Yin disclose conductive polyimides comprising 2,2'bis (3-sulfopropoxy) benzidine (BSPB) (see Kuromatsu, line 0026, Yin, Abstract) and 1, 4,5, 8 naphthalenetetracarboxylic acid dianhydride (NTDA) (see Yin, Abstract), which are the same polyimide ingredients used in the Application.

The advantage of having charged sulfonic groups in polyimide compare to polyimide with electro-active powder is that it provides system with improved storage stability (attached groups are not able to migrate, form clusters, etc.). Note that combination of carbon powder and attached sulfonic group can be also beneficial, since it can produce copolyimide with enhanced electrical and mechanical properties.

Therefore, it would have been obvious to a person of ordinary skills in the art to use BSPB with/or instead of carbon powder in Parish's compositions in order to enhance storage stability, mechanical and electrical properties of the polyimide composition.

Claims 6, 23-25, 30-32 rejected under 35 U.S.C. 103(a) as being unpatentable over Parish (US 5302652) in view of Kuromatsu or Yin and in further view of Lee et al (US 7157548, cited in the previous Office Action) herein Lee.

Parish discloses a conductive polyimide based on ODP(4,4 oxydiphthalic anhydride) and 50% mol APB (1,3 bis (4-aminophenoxy) benzene) and 50%mol HMD (hexamethylene diamine), see Table IV, entry 9). The conductivity achieves with adding carbon particles (see Column 6, line 15). The above material is capable to form a film and have high Tg values. In addition, polyimides, produced with the same synthesis method have intrinsic viscosity values between 1.02 and 1.45 dl/g. Therefore, both Mw and Mn values are higher than 5000.

Kuromatsu or Yin disclose conductive polyimides comprising 2,2'bis (3-sulfopropoxy) benzidine (BSPB) (see Kuromatsu, line 0026, Yin, Abstract) and 1,4,5,8 naphthalenetetracarboxylic acid dianhydride (NTDA) (see Yin, Abstract), which are the same polyimide ingredients used in the Application.

Parish and Kuromatsu or Yin do not disclose a cross-linking polyimide.

Lee discloses a proton-conductive polyimide for fuel cell applications, which has cross-linking moieties in the main chain (see Abstract) and molecular weight of 10000-100000 (see line 0076).

It would have been obvious to a person of ordinary skills in the art at the time the invention was made that conductive polyimide can have crosslinking moieties in its structure in order to increase material stability to degradation and its mechanical properties.

### ***Response to Arguments***

Applicant's arguments filed on 4/10/2008 have been fully considered but they are not persuasive.

Applicant argues that Parish, Kuromatsu and Yin are not combinable, since Parish is directed to a polyimide shaped article, e.g. a sheet or film, whereas Kuromatsu and Yin teach polyelectrolyte membrane.

Examiner disagrees. Parish teaches conductive thin (10-150 um, see Column 5, line 55) film, which can be considered as a conductive membrane. Kuromatsu and Yin also teach conductive membrane. Since their membrane are more stable compare to Parish's one, due to the presence of conductive groups in the polymer structure, it provides a motivation to modify Parish's film.

Rejection based on 35USC 112(2) is withdrawn, due to claim amendments, which eliminated errors in the claims.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY LISTVOYB whose telephone number is (571)272-6105. The examiner can normally be reached on 10am-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Rabon Sergent/

Art Unit: 1796

Primary Examiner, Art Unit 1796

GL